REMARKS

Response to Reissue Application

The Examiner has set forth the requirement for a supplemental reissue oath/declaration in the language acceptable under 37 C.F.R. §1.175(b)(1). Applicant has noted this requirement. The inventor is no longer employed by the assignee in the present application and applicant and applicants are presently unable to locate him. The signed supplemental declaration will be submitted when the inventor is located for signature. In the event that the inventor is not located, the assignee in the present application will execute the supplemental declaration pursuant to 37 CFR 1.47(b) and will then be filed upon receipt.

Response to Claim Rejections Under 35 USC §103

Claims 30, 36, 37, 46-48, 51, 54, 55, 59, 60, 68, 69, 71, 72 and 77 were rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Panescu et al. (U.S. Pat. No. 5,769,847) in view of Nashef et al. (U.S. Pat. No. 5,682,899).

Applicant has carefully reviewed the prior art cited by the Examiner and believe that there are no reasons for combining the teachings of these references. In fact the references teach away from the claimed invention. Specifically, Panescu et al. teach that the temperature sensors (80) which are disposed between adjacent ablation electrodes are configured to detect the temperatures of the adjacent electrodes, not adjacent tissue as contemplated by the present invention. In column 8, lines 11-32 of Panescu et al. it is clear that the temperature sensors are configured to sense the temperatures of the electrodes (not tissue) by the electrically insulating and thermally

conducting polymeric material which encases the sensor. The sensors (80) would not sense the temperature of the adjacent tissue.

When those having ordinary skill in the art would consider the Nasher et al reference, they would discover that the temperature sensor described in the reference has a conductive member secured thereto which is configured to conduct heat away from the temperature sensor, not to the temperature sensor as would be the case with the present invention. Therefore, those having ordinary skill in the art would not be led to combine the teachings of these two references because neither reference would suggest the solution to the problem as set forth in the rejected claims. Indeed, those skilled in the art would be led away from the combined teachings because the combination as proposed by the Examiner would not allow the device to perform the function of the primary reference, namely detecting the temperature of the electrodes. The applicant submits that there is no reason to combine these references and even if they would be combined they would not fairly teach the claimed invention even if broadly interpreted.

Claims 38, 39, 40-45, 50, 52, 61-67, 70 and 73-76 were rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Panescu et al. ('847) in view of Nashef et al. ('899), and further in view of Littman et al. (U.S. Pat. No. 5,509,411).

This rejection suffers from the same deficiencies as the previous rejection based upon Panescu et al. ('847) in view of Nashef et al. ('899). While Littman et al. teaches incorporating conducting members into the catheter wall, the reference fails to teach the same features that Panescu et al. and Nashef et al. fail to teach, namely a temperature sensor for sensing the tissue adjacent to the sensor. Similarly, with respect to the

rejection of claim 39, Alferness et al. fails to teach the same features lacking in the primary and secondary references.

Conclusions

Applicants believe that the pending claims are directed to patentable subject matter. Further consideration pursuant to the concurrently filed RCE and an early allowance are earnestly solicited.

Respectfully submitted,

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Status And Support For All Claims Not Found In Issued Patent And Amendments Thereto Pursuant To 37 CFR §1.173(c)

Claims	Status	Support (Ref. to Issued Patent)
Claim 1	Original	
Claim 2	Original	
Claim 3	Original	
Claim 4	Original	
Claim 5	Original	
Claim 6	Original	
Claim 7	Original	
Claim 8	Original	
Claim 9	Original	
Claim 10	Original	
Claim 11	Original	
Claim 12	Original	
Claim 13	Original	
Claim 14	Original	
Claim 15	Original	
Claim 16	Original	
Claim 17	Original	
Claim 18	Original	
Claim 19	Original	
Claim 20	Original	
Claim 21	Original	
Claim 22	Original	
Claim 23	Original	
Claim 24	Original	
Claim 25	Original	
Claim 26	Original	
Claim 27	Original	
Claim 28	Original	
Claim 29	Original	
Claim 30	Amended	Col. 6, lines 39-45; Col. 5, lines 36-50

Claims	Status	Support (Ref. to Issued Patent)
Claim 31	Amended	Col. 5, lines 36-50; Col. 6, lines 39-45
Claim 32	Amended	Col. 5, lines 36-50; Col. 6, lines 39-45
Claim 33	Original	
Claim 34	Original	
Claim 35	Original	
Claim 36	Twice Amended	Col. 5, lines 36-50
Claim 37	Original	
Claim 38	Pending	
Claim 39	Pending	
Claim 40	Pending	
Claim 41	Pending	
Claim 42	Pending	
Claim 43	Pending	
Claim 44	Pending	
Claim 45	Pending	
Claim 46	Pending	
Claim 47	Pending	
Claim 48	Pending	
Claim 49	Pending	
Claim 50	Pending	
Claim 51	Pending	
Claim 52	Pending	
Claim 53	Pending	
Claim 54	Pending	
Claim 55	Pending	
Claim 56	Pending	
Claim 57	Pending	
Claim 58	Pending	
Claim 59	Pending	
Claim 60	Pending	
Claim 61	Twice Amended	Col. 6, lines 42-47
Claim 62	Twice Amended	Col. 6, lines 42-47
Claim 63	Twice Amended	Col. 6, lines 42-47
Claim 64	Pending	

Claims	Status	Support (Ref. to Issued Patent)
Claim 65	Pending	
Claim 66	Pending	
Claim 67	Pending	
Claim 68	Twice Amended	Col. 6, lines 42-47
Claim 69	Twice Amended	
Claim 70	Twice Amended	Col. 6, lines 42-47
Claim 71	Twice Amended	Col. 6, lines 42-47
Claim 72	Pending	
Claim 73	Twice Amended	Col. 6, lines 42-47
Claim 74	Pending	
Claim 75	Pending	
Claim 76	Pending	
Claim 77	Twice Amended	Col. 6, lines 42-47

Mark-Up of Amended Claims

30. (Amended): An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section;

b) a plurality of electrodes on an exterior portion of the distal shaft section; and

c) a plurality of temperature sensors on an exterior portion of the distal shaft section, being positioned so that at least one temperature sensor is disposed between two adjacent electrodes, and each temperature sensor having a conducting member comprising an annular metal band radially disposed about and adjacent to the shaft and the temperature sensor thereon, which ~~transmits heat~~ facilitates detecting tissue temperature adjacent to conducting member connected to the temperature sensor, and a jacket radially disposed on and about an outer surface of the metal band configured to insulate the temperature sensor from electrical interference from adjacent electrodes.

31. (Amended): An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section;

b) a plurality of electrodes on an exterior portion of the distal shaft section;

c) at least one temperature sensor on an exterior portion of the distal shaft section, being positioned so that the temperature sensor is disposed between two adjacent electrodes;

d) a conducting member connected to the temperature sensor which is configured to facilitate detecting tissue temperature adjacent to the conducting member connected to the temperature to the sensor; and

e) a jacket disposed about the conducting member and a periphery of at least one of the two electrodes adjacent to the temperature sensor which is configured to insulate the temperature sensor from electrical interference from adjacent tissue.

32. (Amended): An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section;

b) a plurality of electrodes on an exterior portion of the distal shaft section;

c) at least one temperature sensor on an exterior portion of the distal shaft section, being positioned so that the temperature sensor is disposed between two adjacent electrodes; and

d) a jacket which is disposed about the at least one temperature sensor and in part disposed about a periphery of the two electrodes adjacent to the at least one temperature sensor and which is configured to insulate the temperature sensor from electrical interference from the adjacent electrodes.

36. (Twice Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section with a proximal portion and a distal portion;

b) a plurality of electrodes on the proximal portion of the distal shaft section, having an interelectrode spacing of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent electrodes and having a conductive metallic band disposed over and connected to the sensor that is configured to insulate the temperature sensor from electrical interference from the adjacent electrodes;

d) an elongated core member in the distal shaft section.

61. (Twice Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section with a proximal portion and a distal portion and a wall portion defining at least in part an inner lumen extending within the distal shaft section;

b) an elongated core member disposed within the inner lumen;

c) a plurality of electrodes on the proximal portion of the distal shaft section, having an interelectrode spacing of about 1 mm to not greater than 3 mm;

d) a plurality of electrical conductors which are at least partially embedded within a wall of the elongated shaft, and which have distal ends electrically connected to an electrode on the proximal shaft portion; and

e) at least one temperature sensor on an exterior portion of the distal shaft section which is disposed between two adjacent electrodes and ~~having~~ which has a conductive metallic band disposed over and connected to the sensor that is configured to tissue facilitate detecting temperature adjacent to the band connected to the temperature sensor.

62. (Twice Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section with a proximal portion and a distal portion and a wall portion defining at least in part an inner lumen extending within the distal shaft section;

b) a plurality of electrodes on the proximal portion of the distal shaft section, having an interelectrode spacing of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent electrodes and having a conductive metallic band disposed over and connected to the sensor which is configured to facilitate detection of tissue temperature adjacent to the band connected to the sensor; and

d) at least one electrical conductor which is at least partially embedded within a wall of the elongated shaft, and which has a distal end electrically connected to the at least one temperature sensor on the proximal shaft portion.

63. (Twice Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, a distal shaft section with a proximal portion and a distal portion and a wall portion defining at least in part an inner lumen extending within the distal shaft section;

b) a plurality of partially covered electrodes on the proximal portion of the distal shaft section;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent electrodes and having a conductive metal band disposed over and connected to the at least one temperature sensor which is configured to facilitate detection of tissue temperature adjacent to the band connected tissue to the temperature sensor[[.]];

d) at least one electrical conductor which has a distal end electrically connected to the at least one temperature sensor on the proximal shaft portion; and

e) a core member disposed in the distal shaft section.

68. (Twice Amended) A method for treating a patient, comprising:

a) the step of providing an electrophysiology device, comprising:

an elongated shaft having a proximal end, a distal end, and a distal shaft section, and a plurality of electrical conductors;

a plurality of electrodes on an exterior portion of the distal shaft section electrically connected to the electrical conductors, having an interelectrode spacing of not more than about 3 mm; ~~and~~

a plurality of temperature sensors on an exterior portion of the distal shaft section, being positioned so that at least one temperature sensor is disposed between two adjacent electrodes, each temperature sensor being electrically connected to at least one of the electrical conductors and having a conductive metallic band disposed over and connected to the sensor which is configured to facilitate

detection of tissue temperature adjacent to the band connected to the temperature sensor;

b) the step of introducing the device into the patient's vasculature and advancing the device until the distal section of the device is disposed at a desired location;

c) the step of positioning the device within a location of the patient's vasculature where one or more electrodes are in contact with a desired surface within the vasculature; ~~and~~

d) the step of delivering high frequency electrical energy to the one or more electrodes in contact with the desired surface to ablate tissue; and

e) the step of detecting electrical activity with one or more of the electrodes after tissue ablation to determine the effectiveness of the tissue ablation.

69. (Twice Amended) The method of claim [[53]] 68 wherein high frequency electrical energy is directed to the electrodes sequentially in a proximal direction.

70. (Twice Amended) An electrophysiology device for forming a continuous lesion in a patient's heart tissue, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section;

b) a plurality of partially covered electrodes on a proximal portion of the distal shaft section, with each electrode having a length of about 2 to about 8 mm and interelectrode spacing of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor disposed between two adjacent electrodes and having a conductive metallic band disposed over and

connected to the sensor which is configured to facilitate detection of tissue temperature adjacent to the band connected to the temperature sensor; and

d) one or more electrical conductors electrically connected to the at least one temperature sensor.

71. (Twice Amended) A method of treating a patient for cardiac arrhythmia by electrically isolating a first tissue region from a second tissue region, comprising:

a) providing an electrophysiology device having an elongated shaft which has a proximal end, a distal shaft section having a proximal portion with a plurality of electrodes with temperature sensors between adjacent electrodes having conductive metal bands disposed over and connected to the sensors which are configured to facilitate detection of tissue temperature adjacent to the bands connected to the temperature sensors and having a distal portion with a distal end:

b) positioning the proximal portion of the distal shaft section at a desired location between the first tissue region and the second tissue region; and

c) ablating a continuous lesion pattern between the first and second tissue regions with the electrodes on the proximal portion of the distal shaft section to electrically isolate the two tissue regions.

73. (Twice Amended) An electrophysiology device for treating cardiac arrhythmia by electrically isolating a first tissue region from a second tissue region, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section with a proximal portion and a distal portion;

b) a plurality of electrodes on the proximal portion of the distal shaft section, having an interelectrode spacing not greater than 3 mm;

c) at least one temperature sensor on the distal shaft section disposed between two adjacent electrodes and having a conductive metallic band extending over and connected to the sensor which is configured to facilitate detection of tissue temperature adjacent to the band connected to the temperature sensor; and

d) a core member extending at least within the distal shaft section formed of a material selected from the group consisting of stainless steel and a NiTi alloy.

77. (Twice Amended) An electrophysiology device, comprising:

a) an elongated shaft having a proximal end, a distal end, and a distal shaft section with a proximal portion and a distal portion;

b) a plurality of electrode means for ablation on the proximal portion of the distal shaft section, having a spacing between electrode means of about 1 mm to not greater than 3 mm;

c) at least one temperature sensor on an exterior portion of the distal shaft section disposed between two adjacent electrodes means and having a conductive metallic band disposed over and connected to the sensor which is configured to facilitate detection of tissue temperature adjacent to the band connected to the temperature sensor; and

d) an elongated core member in the distal shaft section.